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COMPUTER APPLICATIONS FOR THE SWINE PRODUCER

by

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Summary

Swine producers are using the full range of computer technology, from calculators to the main-frame machines located at computer centers, to assist them in managing their operations. The uses fall into two categories--information systems and decision-aids. Programs in use include accounting, inventory control, least-cost ration, financial management, break-even analysis, growth and organization simulation, and scheduling. Producers using these various computer programs have experienced significant increases in profit.

INTRODUCTION

Swine producers are using computers to improve the profitability of their swine enterprises. They have used it to effect change on both elements of the profit equation--costs and returns. Conservative estimates of improved profitability range from $5,000 to $50,000. Not all producers experience these magnitudes of increased profit. Some farmers experience no improvement and others have experienced greater, while others simply attest that using the computer has helped them to not make a costly mistake. A variety of computer hardware (machines) and software (programs) is available that producers can and do use to assist with information and management decisions.

HARDWARE

Recent advancements in technology have filled the gap between calculators and large main-frame machines. Following is a brief discussion of each type of equipment that is available for use.

Calculator: This is the simplest, cheapest, and most used computer hardware. It's doubtful if any farm office is without one. Calculators have very limited capability but are indispensable. The distinguishing characteristic of a calculator is that the operator is required to enter functions (+, -, x, ÷, ...) as they are to be performed. They range in cost from $5 to $500 depending upon the functions and options desired. Given enough time it can accomplish most everything a large computer can.

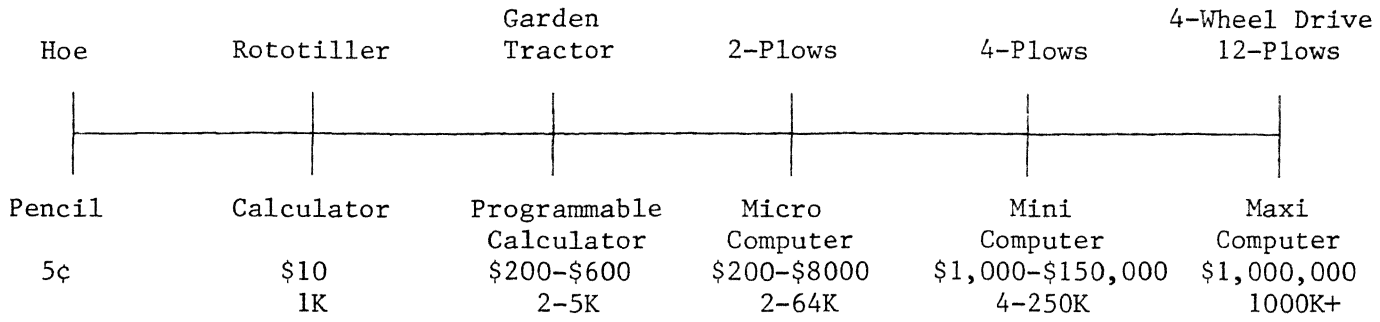
Programmable Calculators: A recent addition to computer technology, these are computers in the truest sense of the word. They can be told (programmed) what to do, when to do it, how to do it, and with what. The operator, after the calculator is programmed, simply asks for the answer rather than entering each mathematical step as it occurs in the solution procedure. These too have limited capability but are quite adequate for many decisions that require considerable time and are solved repeatedly using the same solution procedure. The primary difficulty with the programmable calculator is the programming. To minimize this problem, to make the machine more useful, and to eliminate each user having to re-invent the wheel, numerous programs are available that an operator can copy onto his or her calculator and chips containing some programs can be purchased and inserted into the calculator when needed. This piece of hardware is portable and the user has control of the processor. Programmable calculators cost anywhere from $50 for those with limited capacity (steps and storage) to $600 for those with greater capacity.

Mini and Micro Computers: The "personal" computer has come of age. It is now possible to have an on-farm computer that can do everything from accounting and economic analysis to telling you when a bearing needs greasing. Mini computers can store and retrieve enormous amounts of data and perform different kinds of analyses and projections. They can solve routing simple problems as well as the fairly complex. The biggest problem associated with mini computers is programming. The software available for agricultural

applications is very limited and it can cost as much as $40 as hour to hire a programmer. A good rule of thumb for business applications is---software costs will equal approximately 8 times your hardware cost. The "bare bones" system that is widely advertised for $1000 or less is generally not adequate for what farmers want. It will probably cost from $4,000 to $10,000 to obtain the capacity needed for most farm businesses, but you could spend $150,000 if so desired. These machines also have limited capability but can be purchased with an interface enabling the user to access a main-frame computer for problems larger than the mini can handle or for programs not available on the mini computer.

Maxi or Main-Frame Computer: These machines are too expensive for individuals to purchase. They are larger, faster, and more reliable, have more processing and storage capacity than do mini computers, and are best adapted to the more complex problems a farmer faces. They can do everything the mini can plus much more and with less capital investment. A producer can utilize the main-frame computer by investing in a remote terminal and contracting with computer centers for time and space. Operating costs will be significantly higher with the maxi computer. A good remote terminal can be purchased for $1000 to $3000.

A good perspective on the capability of these various machines is obtained by relating computer technology to another technology that is easier to associate with. The following diagram does that.



APPLICATIONS

Swine producers make use of the computer to assist them in both information management and decision-making--the most common use being information management. The more powerful and less common use is an assist in making decisions.

Information Management

The simple storage, retrieval, and analysis of physical and economic data for the swine enterprise is commonplace yet there are many producers that do not avail themselves of this service that can be purchased. Services of this nature are available through the Cooperative Extension Service, Production Credit Associations, and numerous commercial vendors. These services are primarily computerized accounting for the farm and by enterprise if so desired. The university and Production Credit Systems provide some analysis of the data and compare your data with other producers. The accounting can be done with monthly or annual summaries.

Some commerical firms are beginning to develop inventory control programs that are or will be available to producers in the near future. The Cooperative Extension Service in cooperation with the

Pork Producers Association is developing a computerized record-keeping system that will provide an operator with detailed information about health, litter size, conception, rate of gain, mortality, feed efficiency, etc. about each animal on the farm. Some of these systems are now functioning but like any good information they require accurate and timely collection and entry of primary data. Always remember the computer will not reduce record keeping and management time. It will, however, enable a person to better manage the swine enterprise for profit. The quality of management decisions is directly related to the quality of information used. Good information can then be used with numerous computer decision-aids to improve the profitability of the swine enterprise.

Decision-Aids

Decisions that swine producers make can generally be classified as tactical (day-to-day) and strategical (long range planning). The computerized decision-aids that swine producers are using will be discussed using this classification. In general the programs available on the programmable calculators are of a tactical variety while those on the mini and maxi computers also include strategic models. The very large and complex models, tactical and strategic, are available only on the maxi computer.

Tactical Programs

1. Least-Cost Swine Rations: This model is only available on the maxi machine. It computes least-cost diets from available ingredients that will meet the nutritional requirements of livestock

being fed. Using this model in conjunction with the Ration Analysis Program, made available through the Cooperative Extension Service, a swine producer may be able to reduce feed expense by 25%. Some farmers have been able to reduce feed expense by as much as $3 per hundred weight.

2. Scheduling: This model is used to project space requirements for the various stages of production. The farmer specifies number of sows, litters per sow per year, heats skipped, conception rate, litter size, mortality rate, growth rates, etc. It is a valuable tool for estimating housing requirements and locating tight spots in the production schedule for a particular farm. The model is now available on the maxi-machine but could be programmed for a mini or programmable calculator.

3. Break-Even Analysis: The purpose of this program is to calculate the maximum bid price for feeder pigs. The user specifies expected cash receipts and expenses, purchase and sales weights, feed requirements, and prices. It is very easy to generate a range of bids associated with varying prices of feed and fat hogs. This is an excellent application for the programmable calculator.

4. Ration Balancer: This model, available on the programmable calculator, mini, and maxi computer, calculates a balanced ration utilizing the Person Square method but does not minimize cost. It is useful but not as effective in increasing profit as is the least-cost model. Versions of this are also available on mini and maxi computers.

Strategic Programs

1. Financial Management: This program enables the user to readily compare "average" annual results of alternative strategies for growth and organization. The user must specify changes in enterprises (type and size), associated cash flows using block budgets, and changes in investment and debt service. The program is only available on the maxi computer because of its large size.

2. Transitional Planning: Like the previous model this only budgets alternatives that are specified by the user and is only available on a maxi machine. It differs from the previous model in that it projects an annual situation for each of five years taking into consideration inflation and timing of changes in size and/or organization.

3. Swine Farm Simulation: This is the most complex and powerful model available to swine farmers. It projects the present operation, a selected alternative, and a computer (best) plan for the farm under consideration. Unlike the others mentioned above, this model does its own thinking and deciding within capital, labor, growth, enterprise, management system, type of buildings, and scheduling restraints specified by the user. It is as simple to use as saying--"I have no swine enterprise, what should I do?" The model will project a plan, specify capital needs, type and time of building construction, feed and labor requirements, cash flows, and hog sales and purchases on a two week basis for a five year period. It also projects an inventory

and net worth statement at the end of each year by keeping track of new loans, old loans, loan payments, depreciation schedules, crop and livestock inventories, and cash flows. This model has been widely used and has influenced decisions on many swine farms. It is only available on the maxi computer and cannot be accessed with the remote terminal.

A brief explanation on one of the many real-life uses made of this model will demonstrate its characteristics and usefulness. A family wanted to investigate the economic feasibility of replacing their current farrowing and nursery facilities and adding sixty sows. Table 1 presents an abbreviated summary of the printout they received.

Table 1: Comparison of Alternative Plans
End of Five Years

Item	Present Plan	Replace Bldgs. Add 60 Sows	Computer Plan
Acres	700	700	700
Sows	90	150	168
Hogs Sold	1,354	2,412	2,715
Management System	6 litter	6 litter	12 litter
Net Worth	$1,775,000	$1,770,000	$1,806,000
Maximum % Debt	8	12	11
New Loans	$1,000	$102,000	$62,000
Type of Building	None	Slatted	Partial Slat
Growth Restriction	-	-	Labor

From the analysis the family was able to see that their plans to replace the buildings and add sixty sows would likely: (1) result in a loss in net worth, (2) increase their percent debt, and (3) require new loans amounting to approximately $102,000. The computer

plan indicated that buildings could be replaced, size could be increased, fewer borrowed dollars would be required, and additional net worth generated if the management system was intensified and the type of construction was changed. Based on these projections the family proceeded with their replacement and expansion plans utilizing a more intensive management system and different type of construction than they had decided upon before utilizing the model. The model provided additional information that the family used to change their growth and management strategy from one which would in all likelihood have resulted in economic loss to one of probable gain. This is but one of the many situations where this model has had a significant impact on decisions being made.

SUMMARY

Computer tools are having an impact on swine farm decisions. The most dramatic evidence of impact is in the development of least-cost rations and in planning growth and management strategies. At this point in time the programmable calculator is a good investment for the operator who is repeatedly solving a small problem that can be programmed on the calculator. The micro or mini computer is a questionable investment right now. Very few programs that will be of use to swine producers are available and the cost of hiring it done is prohibitive. The best bet right now is the purchase or use of a remote terminal that will provide access to the maxi computer which contains the powerful least-cost, simulation, and financial management programs. Remote terminals, available for Ohio farmers

to use, are located in Area Extension Offices. The first step, if not already done, should be to utilize one of the many computerized enterprise accounting systems available through the Cooperative Extension Service or commercial vendor. Good information is a must if the decision-aid programs are to be of use to operators in making profitable decisions. Contact your County Agent about the OSU Farm Record Project.